

DOCKETED	
Docket Number:	22-AAER-05
Project Title:	Appliance Efficiency Regulations for Water Closets
TN #:	249490
Document Title:	Plumbing Manufacturers International Comments - PMI Comments on Appliance Efficiency Regulations for Water Closets
Description:	N/A
Filer:	System
Organization:	Plumbing Manufacturers International
Submitter Role:	Public
Submission Date:	3/29/2023 11:43:15 AM
Docketed Date:	3/29/2023

*Comment Received From: Plumbing Manufacturers International
Submitted On: 3/29/2023
Docket Number: 22-AAER-05*

PMI Comments on Appliance Efficiency Regulations for Water Closets

Additional submitted attachment is included below.



March 29, 2023

PMI 2023
Board of
Directors

California Energy Commission
Docket No. 22-AAER-05
715 P Street
Sacramento, CA 95814

Sal Gattone
LIXIL
President

RE: PMI Comments – Request for Information and Invitation to Submit Proposals on Appliance Efficiency Regulations for Water Closets – Docket No. 22-AAER-05

Chip Way
Lavelle
Industries
Vice President

Dear Commissioners:

Belinda Wise
KEROX LTD
Secretary-
Treasurer

Plumbing Manufacturers International (PMI) appreciates the opportunity to provide comments on the California Energy Commission's request for information and invitation to submit proposals on appliance efficiency regulations for water closets, which was published on December 14, 2022.

Martin Knieps
Viega, LLC
Immediate Past
President

PMI is an international, U.S.-based trade association representing manufacturers that provide 90% of the plumbing products sold in the United States. We have made the promotion of water safety and efficiency a top priority and have included this in our mission statement¹. PMI's members are industry leaders in producing safe, reliable and innovative water efficient plumbing technologies and have supported the U.S. EPA WaterSense® program since its inception. **In California, plumbing manufacturers contribute \$10.5 billion to the economy, provide more than 55,900 jobs (direct and indirect) and generate \$3.4 billion in wages.**

Bob Neff
Delta Faucet
Co.

Daniel
Gleiberman
Sloan Valve Co.

Kevin Campbell
MOEN

Lowell Lampen
Kohler Co.

PMI understands that California is just beginning to recover from historic drought conditions, and we support efforts to encourage water efficiency in ways that can be implemented quickly. The CEC may receive responses to this RFI/request for proposals that recommend lowering the current Title 20 flush rates for water closets as a water-saving effort over an extended period of time. PMI does not believe lowering the current Title 20 flush rates will save dramatically more water and it certainly will not do so quickly. PMI strongly urges the CEC to focus its efforts on the replacement of legacy plumbing products with Title 20 compliant products to achieve significant and immediate water savings. We offer additional information below on why a legacy replacement project is best suited for addressing water efficiency in a timely manner.

¹ PMI's Mission: To promote the water efficiency, health, safety, quality and environmental sustainability of plumbing products while maximizing consumer choice and value in a fair and open marketplace. To provide a forum for the exchange of information and industry education. To represent openly the members' interests and advocate for sound environmental and public health policies in the regulatory/legislative processes. To enhance the plumbing industry's growth and expansion.

In 2022, PMI commissioned GMP Research to conduct a market penetration study for California Title 20 compliant plumbing fixtures and fittings to understand the long-term and short-term impact of our member products in the state. The study was completed in early August 2022. A summary of installed residential water closets from the GMP Research study is included below in Table 1.

Table 1: Summary of Installed Water Closets in CA from GMP Research Study²

Residential Toilets	Total Installed by Region (Millions)				SB 535 Disadvantaged Communities (Millions)			
	3.5+ gpf	1.6 gpf	1.28- gpf	Total	3.5+ gpf	1.6 gpf	1.28- gpf	Total
Northern California	0.211	2.828	0.886	3.925	0.012	0.145	0.039	0.196
SF Bay Area	0.360	3.993	1.251	5.604	0.030	0.320	0.086	0.436
Central California	0.327	3.708	1.411	5.446	0.103	1.183	0.368	1.654
LA + Orange Counties	0.730	8.674	2.745	12.149	0.242	2.992	0.794	4.028
Southern California	0.455	4.819	1.489	6.763	0.082	0.802	0.215	1.099
Total	2.08	24.02	7.78	33.89	0.47	5.44	1.50	7.41
Market Penetration %	6.1%	70.9%	23.0%		6.3%	73.4%	20.3%	



Note: Map of California Showing the Regions in Table 1 (From top: Northern California, SF Bay Area, Central California, LA+ Orange Counties, Southern California): Map Source: U.S. Census Bureau:

² "California Market Penetration of Water-Efficient Plumbing Products Study" GMP Research Inc., 2022, Commissioned by Plumbing Manufacturers International.

The GMP Research study shows that there are 33.9 million residential water closets installed in California. Of these, 24.0 million are 1.6 gpf and an additional 2.1 million are 3.5 gpf or higher. These results indicate that despite 2016 legislation requiring all water closets to comply with the Title 20 flush rate requirements, only 23% of water closets currently installed in California are Title 20 compliant.

With the research demonstrating that more than 75% of water closets are currently not compliant with Title 20 requirements, this represents an opportunity for California to realize significant water savings with legacy replacement programs. Statewide, up to 326 billion gallons of water can be saved over 30 years by replacing 26.1 million 1.6+ gpf toilets with 1.28 gpf toilets. Additionally, disadvantaged communities are less likely to replace older water closets. For comparison: In owner-occupied homes, water closets are replaced every 30 years on average. In SB 535 disadvantaged communities owner-occupied homes, water closets are replaced every 35 years, and in rental properties in disadvantaged communities water closets are replaced every 40 years. As a result, more than 80% of the water closets (5.9 million) in SB 535 disadvantaged communities are not compliant with Title 20, and 6.7% or 0.5 million of these are 3.5 gpf or greater. An immediate savings of 8 billion gallons of water could be realized by replacement of non-Title 20 compliant water closets in SB 535 communities alone.

PMI notes that manufacturers have worked diligently to develop extensive lines of Title 20 compliant water closets since the CEC adopted the new Title 20 requirements in 2016. The maximum 1.28 gpf requirement in CA Title 20 for water closets is consistent with the minimum requirements specified by EPA WaterSense. A review of the EPA WaterSense product listing database on August 14, 2022, reveals that there are 4778 models of water closets from 158 different brands that comply with the existing CA Title 20 requirements.

In addition to advocating for rebate and incentive programs for legacy water closet replacement, PMI is in full support of the EPA WaterSense program. The EPA WaterSense specifications for water closets have been thoroughly vetted by stakeholders and include flush rate requirements as well as testing and verification for product performance and safety through reference to the applicable national standards. Specifying flush volumes for water closets lower than those specified and tested to these national standards could cause public health and safety concerns. Some of these concerns are noted in the November 2017 white paper titled: *“Adapting to Change: Utility Systems and Declining Flows”*³, in which issues with California’s drinking water, wastewater and recycled-water infrastructures have been highlighted due to reductions in indoor water use caused by California appliance efficiency standards. PMI strongly recommends that the CEC carefully analyze the impact on the state’s infrastructure before additionally lowering efficiency standards such as those for water closet flush rates. Without such an analysis, there could be risks to public health.

³ “Adapting to Change: Utility Systems and Declining Flows,” California Association of Sanitation Agencies (CASA), Water Research Foundation (WRF), WaterReuse California, California Water Environment Association (CWEA) and California Water Urban Agencies (CUWA), November 2017, http://www.cuwa.org/pubs/CUWA_DecliningFlowsWhitePaper_11-28-17.pdf.

Finally, it is important to note that current law in CA established through SB 407 (Chapter 587 Statutes of 2009) and SB 837 (Chapter 61 Statutes of 2011) compliant plumbing fixtures and fittings for single family residences and for multi-family and commercial buildings should be a current reality. The anticipated target dates for implementation of these bills were to have all single-family residences in compliance by January 1, 2017, and for multi-family and commercial building compliance by January 1, 2019. The findings demonstrated through the GMP research study is that these targets have not been accomplished. Before the state implements new more restrictive regulations it should concentrate on ensuring a complete transition to products compliant with existing law. Therefore, the legacy water closet replacement program will benefit both the residents of the state as well as regulators by demonstrating that their governing bodies follow through with the objective of replacing non-compliant plumbing fixtures.

The following questions were presented in the Request for Information for which CEC staff is seeking feedback in relation to the topic of water closets:

1) Based on Table 1, are there additional examples that should be considered in scope or out-of-scope? Based on what factors?

No. It is important for manufacturers to have consistent definitions in federal, state, and national standards.

2) Is it necessary to update existing terms and definitions for water closets for added clarification or to align with existing terminology from other entities? For example, should the definition of water closets as defined in section 1602, CCR, Title 20, align with the federal definition of water closets as defined in section 420.2, Code of Federal Regulations, Title 10?

Yes. The definition of water closets should be revised to align with the definition in the national product standard ASME A112.19.2/CSA B45.1 as follows.

“Water closet” means a plumbing fixture ~~having~~ with a water-containing receptor that receives liquid and solid body waste and on actuation, conveys the waste through an exposed integral trap into a ~~gravity~~ drainage system.

3) Are there additional terms that should be considered and defined in section 1602, CCR, Title 20 for water closets to cover new features in the current market or for added clarification?

No. It is important for manufacturers to have consistent definitions in federal, state, and national standards.

4) Are there new efficient technologies available on the market? Are there new upcoming developments?

Yes. Manufacturers are always researching new technologies to best match water efficiency with performance. ASME A112.19.2/CSA B45.1 and the EPA WaterSense Specification for Tank-Type Toilets are the performance standards ensuring product performance and the necessary minimum health and safety requirements for these products. As new technologies are developed these product standards are regularly reviewed and updated as needed to consider performance and safety along with other factors. Any updates to these standards must take into consideration drain line carry. Even if a water

closet can effectively evacuate the contents of the bowl into the drain line it is not necessarily guaranteed that the waste will be carried the length of the drain line to the sewer main (see Question 10). Drain line carry performance is directly tied to the state's building infrastructure. Without careful analysis of the impact of lowering efficiency standards for water closets there could be risk to public health. It is also important to note that actions taken by the CEC should not hinder further innovation in technology.

5) Are there new technologies or features available on the market that extend the lifetime of the product or that allows for less maintenance during the lifetime of the product?

Yes. Manufacturers continually strive to extend product lifetimes without compromising quality and performance. As CEC staff notes in Question 18, water closet bowls and tanks are a "lifetime" product with an at least 25-year life cycle. Minor maintenance is required to sustain the lifecycle of water closets.

6) Have design improvements been made to reduce toilet leaks? If so, can any of these design improvements be included in amended performance standards for gravity tank-type water closets?

Manufacturers are continually improving and innovating the technology in their product offerings. Currently available Title 20 compliant toilets leak much less than legacy toilets. In addition, flush valve seal technology has improved, and current products must meet ASME A112.19.5/CSA B45.15 as a base requirement including an accelerated chemical resistance and leak rate test to ensure longevity of flush valve seals. This test has been part of the standard requirements since at least the 2011 edition was published, and the water closets subject to this test procedure have proven to be robust and exhibit reductions in toilet leaks. Older water closets that are still in use do tend to leak and require routine maintenance of the flushing mechanism to stop or prevent leaks. New technology is available in tank trim and replacement of these older legacy water closets (those using 1.6 gpf or more) with EPA WaterSense and Title 20 compliant 1.28 gpf models would significantly address any potential toilet leaks and should be a priority in the state.

7) Are there any other technology-specific issues to consider?

No answer.

8) For dual-flush water closets, can design improvements be made to encourage end users to use the low-flush option more often?

Yes.

Manufacturers are employing options such as making the reduced flush activator an easier target for the user (e.g. larger in size, more colorful, higher) than the full flush option.

9) Are there any sanitation issues or plumbing issues with existing water closets? If so, what are they? Do those issues vary in residential settings versus commercial settings?

Yes.

There are issues with drain clogging and transportation of solids out of the building and into the sewer with reduced flush volumes (see Question 10). Double flushing becomes more common to entirely clear waste from the water closet as the flush volume is reduced. In addition, incomplete removal of material from the bowl surface requires the user to scrub the water closet bowl after each use. Typically, the lower the flush volume of water closets the more these issues are exacerbated.

Commercial buildings can have extensive runs of drain line pipe from the building to the sewer main connection. Issues with the drain line carry of solids leading to blockages increases in commercial settings due to the length of the drain line and incorporation of low flow fixtures and fittings including low flow water closets into existing buildings.

10) Do low-flush toilets and low-flow appliances contribute to drain line blockages? Are blockages of particular concern for commercial applications where the slope of the drain line may be low? Are drain line blockages currently a significant issue in California? What remedies are available for people or businesses experiencing drain line blockages?

As noted in the 2017 CASA Whitepaper⁴ “Declining system flows decrease wastewater flows and may increase pollutant and solids concentrations, which increase blockages, odors, and corrosion in pipes. This leads to increases in operation and maintenance (O&M) costs, odor complaints, and an accelerated degradation of infrastructure.”

The current infrastructure of drains and sewers in California are designed for much higher flow rates than what is currently in use resulting in difficulties with drain line carry leading to clogging in building drains and backups in the sewer system.

Findings from the (PERC 1.0, 2012) study⁵ are that in five (5) out of sixteen (16) test runs conducted at 0.8 gpf volume the test media in the test apparatus compressed together to form large plugs in the drain line that resulted in full-pipe or near full-pipe conditions.

In addition, the (PERC 2.0, 2016) study⁶ notes a significant decrease in drainline transport performance between the 1.28 gpf and 1.0 gpf flush volumes and includes the following statement:

It is specifically noted that “PERC does not recommend the use of 3.8 Lpf / 1.0 gpf toilets (or less) in commercial applications that have long horizontal drains and that do not provide additional long duration flows from other sources to assist with the drainline transport of solid waste.”

11) Are there other regulatory or voluntary approaches available? Please include references to publicly available sources.

Yes.

Water closets that are Title 20 compliant and certified to EPA WaterSense provide the consumer with water efficiency and performance. Because performance is so important to public health issues related to toilets and drain lines, it is important that the CEC follow the ASME standard and EPA WaterSense certification processes. It is PMI’s understanding that the EPA is currently considering a potential revision of the WaterSense specification for tank-type water closets to specify a flat flush rate of 1.28 gpf for both dual and single flush water closets.

12) Is there current research or advancements in standards for water closets?

Yes.

⁴ “Adapting to Change: Utility Systems and Declining Flows,” California Association of Sanitation Agencies (CASA), Water Research Foundation (WRF), WaterReuse California, California Water Environment Association (CWEA) and California Water Urban Agencies (CUWA), November 2017, http://www.cuwa.org/pubs/CUWA_DecliningFlowsWhitePaper_11-28-17.pdf.

⁵ Plumbing Efficiency Research Coalition (PERC 1.0), The Drainline Transport of Solid Waste in Buildings, November 2012. <https://plumbingefficiencyresearchcoalition.org/wp-content/uploads/2012/12/Drainline-Transport-Study-PhaseOne.pdf>

⁶ Plumbing Efficiency Research Coalition (PERC 1.0), The Drainline Transport of Solid Waste in Buildings –Phase 2.0, September 2015, Revised March 2016. https://plumbingefficiencyresearchcoalition.org/wp-content/uploads/2016/04/PERC-2-0_2-1-FINAL.pdf

ASME A112.19.2/CSA B45.1 and the EPA WaterSense Specification for Tank-Type Toilets are the performance standards ensuring product performance and the necessary minimum health and safety requirements for these products, and they are updated as needed to consider performance and safety along with other factors. It is PMI's understanding that the EPA is currently considering a potential revision of the WaterSense specification for tank type water closets to specify a flat flush rate of 1.28 gpf for both single and dual flush water closets.

13) What is the market share of each identified classification in Table 1?

No Answer

14) What is the market share of gravity tank-type water closets based on flush volume?

According to the 2022 GMP Research report conducted to determine the market penetration of Title 20 compliant plumbing fixtures and fittings in the California market:

- 23.0% of installed water closets are EPA WaterSense and Title 20 compliant 1.28 gpf.
- 70.9% of installed water closets are 1.6 gpf.
- 6.1% of installed water closets are 3.5+ gpf.

15) What sources of information are available to estimate current and projected stock in California?

No Answer

16) What are the retail costs per unit or differences in costs among the various types of water closets listed in Table 1?

There is not a significant difference between the average cost of a single-flush and dual flush water closet. The average cost is around \$500 although the price range can be anywhere from \$100 to \$3000 or more.

17) What are the installation costs? What are the repair costs versus replacement costs?

The average cost to install a water closet is between \$200 to \$400.

Repairs can range between \$10 and \$200 depending on the plumbers' fees and price of the part.

18) Staff estimates the product lifetime of water closets is 25 years. Are there alternative assumptions for product lifetime that staff should consider and why? How do product lifetimes vary by product type? Please provide sources of information for those alternative assumptions.

Water closets manufactured before 1980 can use between 5 and 8 gallons per flush. Given the longevity of the product there are still some of these ultra-high flush rate water closets in use today. More commonly however, water closets manufactured and installed in California prior to 2016 use 1.6+ gallons per flush. These water closets can last indefinitely if maintained but are typically replaced within 25 to 40 years. Due to the longevity of the product, older water closets are still much in use. According to the GMP Research report, 77% of water closets in California are 1.6+ gpf. These legacy products can and should be replaced with newer water efficient water closets that meet the EPA WaterSense and CA Title 20 requirements of 1.28 gpf. If the 77% of 1.6+ gpf residential water closets were replaced with new efficient water closets by 2028, the state of California would save 326 billion gallons of water over the next 30 years. There are a number of methods to achieve this legacy product replacement initiative including through direct replacement, rebate, and incentive programs.

GMP Research Inc. determined a life expectancy of 30 years for residential toilets in owner-occupied homes; 35 years for toilets in rental properties and owner-occupied homes in SB 535 disadvantaged communities; and 40 years for rental properties in SB 535 disadvantaged communities.

Sources: NAHB/Bank of America Study of Life Expectancy of Home Components, InterNACHI's standard life expectancy for home products, from the Guide on the Life Expectancy of Rental Property Items, inputs from plumbing fixture/fittings manufacturers and from rental property managers

19) Which sources should be considered to estimate commercial water and electricity utility rates?

No Answer

20) Do some manufacturers provide broad product offerings while others focus on specialty products?

Yes.

21) How many small businesses are involved in the manufacturing, sale, or installation of these products in California? And how might small businesses be affected by any changes to existing water closets?

No Answer

22) What are the potential impacts and benefits that proposed standards may have on low-income customers and disadvantaged communities?

Any proposal to lower the flush rate of water closets lower than the current Title 20 levels should consider potential health and safety issues that will arise in homes and buildings that were not designed for ultra-low flow fixtures. If the goal is to save water as fast as possible, then the best approach for all communities is a legacy replacement program focused on current Title 20 compliant products. There are additional user experience concerns for some ultra-low flow water closets that U.S. consumers are not used to managing (e.g., additional scrubbing, additional flushing).

Conclusion:

Despite record rainfall in January and February of this year, California continues to face drought conditions and long-term water supply challenges. In 2009 and 2011 bills SB 407 and SB 837 were enacted with the intent of saving water in California. The objective at that time, to have all water closets in compliance with the flush rate requirements of 1.28 gpf by 2017 and 2019 respectively, has not been fulfilled. However, the prevailing goal, to save water, has not changed.

In the comments above PMI encourages the goal of saving water and the solution we propose is targeted to addressing the issue of a significantly low level of market penetration (less than 25%) of these products through incentives, rebates, and direct replacement programs versus strenuous enforcement actions. The best approach for all communities is a legacy product replacement program focused on installation of current Title 20 compliant products. Without a thorough analysis of the impact of further lowering efficiency standards, such as the flush rate of water closets, on its infrastructure the state could inadvertently put public health at risk. The current specification of 1.28 gpf is an ideal balance between water savings and the need for water closet performance including

effective flushing, washdown and drain line carry. PMI encourages the CEC to support replacement of legacy water closets (those using 1.6 gpf or more) with water closets that use 1.28 gpf versus reducing the mandatory flush rate for these products further.

In the interest of all parties, it should be noted that PMI and its members played a critical role along with the CEC in establishing the revised water consumption values which appear in the current Appliance Efficiency Regulations. This accomplishment from 2016 serves the purpose of paving the path forward for the state in its endeavor to achieve additional water savings integral to the goals of the Commission. It is understood that much of the benefit gained from such savings is intended to be obtained over the long term as a result of market penetration via product replacement.

PMI looks forward to participating further in this request for information and invitation to submit proposals. Please do not hesitate to contact us if you have any questions or need further information. Thank you for considering our request.

Sincerely,



Kyle Thompson
Technical Director
Plumbing Manufacturers International
Office: 847-217-7212
kthompson@safeplumbing.org

cc: Members

PMI Members

*Bradley Corporation *Brasscraft Manufacturing Company *CSA Group *Delta Faucet Company *Dornbracht Americas, Inc. *Duravit USA, Inc.
*Fisher Manufacturing Company *Elkay Manufacturing Company *Fluidmaster, Inc. *Gerber Plumbing Fixtures, LLC *Hansgrohe, Inc.
*Haws Corporation *IAPMO *International Code Council – Evaluation Service (ICC-ES) *KEROX LTD *Kohler Company
*Lavelle Industries, Inc. *LIXIL *MOEN *NEOPERL, Inc. *NSF International *Pfister
*Reliance Worldwide Corporation *Similor AG *Sloan Valve Company *Speakman Company
*Sprite *Symmons Industries, Inc. *T & S Brass and Bronze Works, Inc. *TOTO USA *UL, LLC
*Uponor *Viega, LLC *Water Pik, Inc. *WCM Industries, Inc.